AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1-156 (cancelled)

157. (Previously Presented) A stabilized radiopharmaceutical composition comprising:

(a) a diagnostic or therapeutic radionuclide, optionally complexed to a chelator; and

(b) a stabilizer selected form the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer comprising a composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising a dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

158. (Previously Presented) A stabilized radiopharmaceutical composition comprising:

(a) a metal chelator complexed with a radionuclide;

(b) an optional linking group and a targeting molecule; and

(c) a stabilizer selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

159. (Previously Presented) A stabilized radiopharmaceutical composition comprising:

(a) a compound of the general formula:

M-N-Q

wherein

M is a metal chelator complexed with a radionuclide;

N is an optional linker;

Q is a targeting molecule; and

(b) a stabilizer selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising a dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

160. (Currently Amended) A stabilized radiopharmaceutical composition comprising:

(a) a compound of the general formula:

M-N-O-P-Q

wherein

M is a metal chelator complexed with a radionuclide;

N is 0, an alpha amino acid, a non-alpha amino acid with a cyclic group, or other linking group;

O is an alpha amino acid, or a non-alpha amino acid with a cyclic group;

P is 0, an alpha amino acid, a non-alpha amino acid with a cyclic group, or other linking group;

Q is a targeting molecule;

wherein at least one of N, O or P is a non-alpha amino acid with a cyclic group; and

(b) a stabilizer selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

161. (Previously Presented) A stabilized radiopharmaceutical composition comprising:

(a) a compound of the general formula:

M-N-O-P-Q

wherein

M is a metal chelator complexed with a radionuclide;

N is 0, an alpha amino acid, a substituted bile acid, or other linking group;

O is an alpha amino acid, or a substituted bile acid;

P is 0, an alpha amino acid, a substituted bile acid, or other linking group;

Q is a targeting molecule;

wherein at least one of N, O or P is a substituted bile acid; and

(b) a stabilizer selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising a dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

162. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161 wherein the stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol, further comprises selenomethionine, selenocysteine, methionine, cysteine or derivatives thereof.

163. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the water-soluble compound containing selenium in the +2 oxidation state and is selected from the group consisting of selenomethionine, selenocysteine or derivatives thereof.

164. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the stabilizer comprising a dithiocarbamate compound comprises a compound of the formula:

wherein R1 and R2 are each independently H; C_1-C_8 alkyl; -OR3, wherein R3 is C_1-C_8 alkyl; or benzyl, either unsubstituted or optionally substituted with water solubilizing groups; or wherein R1, R2, and N combined together form 1-pyrrolidinyl-, piperidino-, morpholino-, 1-piperazinyl-; and

M is H^+, Na^+, K^+, NH_4^+, N-methylglucamine, or other pharmaceutically acceptable +1 ion, in the +1 oxidation state; or

M is Mg^{2+} or Ca^{2+}, or other physiologically acceptable +2 metal ion, in the +2 oxidation state.

165. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the stabilizer comprising a dithiocarbamate compound is selected from the group consisting of 1-pyrrolidine dithiocarbamic acid ammonium salt, sodium diethyldithiocarbamate trihydrate, sodium dimethyldithiocarbamate hydrate, and combinations thereof.

166. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claim 157 to 161, wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises cysteine or a derivative thereof, mercaptoethanol, dithiolthreitol, or pharmaceutically acceptable salts thereof.

167. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises a cysteine derivative selected from the group consisting of cystamine dihydrochloride, cysteine hydrochloride monohydrate, cysteine ethyl ester hydrochloride, cysteine diethyl ester dihydrochloride, cysteine methyl ester hydrochloride, cysteine dimethyl ester dihydrochloride, cysteinesulfinic acid monohydrate, 5-thio-d-glucose, reduced l-glutathione, and combinations thereof.

168. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 158 to 161, wherein the linker or linking group is a peptide, a hydrocarbon linking group or a combination thereof.

169. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the metal chelator is selected from the group consisting of DTPA, DOTA, DO3A, HP-DO3A, PA-DOTA, MeO-DOTA, MX-DTPA, EDTA, TETA,

EHPG, HBED, NOTA, DOTMA, TETMA, PDTA, TTHA, LICAM, MECAM, CMDOTA, PnAO, oxa-PnAO, N,N-dimethylGly-Ser-Cys; N,N-dimethylGly-Thr-Cys; N,N-diethylGly-Ser-Cys; N,N-dibenzylGly-Ser-Cys, N,N-dimethylGly-Ser-Cys-Gly; N,N-dimethylGly-Thr-Cys-Gly; N,N-diethylGly-Ser-Cys-Gly; and N,N-dibenzylGly-Ser-Cys-Gly.

170. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 158 to 161, wherein the targeting molecule is a targeting peptide.

171. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 158 to 161, wherein the targeting molecule is selected from the group consisting of LHRH, insulin, oxytocin, somatostatin, NK-1, VIP, Substance P, NPY, endothelin A, endothelin B, bradykinin, interleukin-1, EGF, CCK, galanin, MSH, Lanreotide, Octreotide, Maltose, arginine-vasopressin, a GRP receptor targeting molecule, and analogs and derivatives thereof.

172. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 158 to 161, wherein the targeting molecule is a GRP receptor targeting molecule, which is optionally an agonist or a peptide which confers agonist activity.

173. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 158 to 161, wherein the targeting molecule is a GRP receptor targeting molecule that is bombesin or an analog thereof.

174. (Previously Presented) A stabilized radiopharmaceutical composition according to any one of claims 157 to 161, wherein the radionuclide is selected from the group consisting of ^{99m}Tc, ^{51}Cr, ^{67}Ga, ^{68}Ga, ^{47}Sc, ^{167}Tm, ^{141}Ce, ^{123}I, ^{125}I, ^{131}I, ^{18}F, ^{11}C, ^{15}N, ^{111}In, ^{168}Yb, ^{175}Yb, ^{140}La, ^{90}Y, ^{88}Y, ^{86}Y, ^{153}Sm, ^{166}Ho, ^{165}Dy, ^{166}Dy, ^{62}Cu, ^{64}Cu, ^{67}Cu, ^{97}Ru, ^{103}Ru, ^{186}Re, ^{188}Re, ^{203}Pb, ^{211}Bi,

^{212}Bi, ^{213}Bi, ^{214}Bi, ^{225}Ac, ^{211}At, ^{105}Rh, ^{109}Pd, ^{117m}Sn, ^{149}Pm, ^{161}Tb, ^{177}Lu, ^{198}Au and ^{199}Au and oxides or nitrides thereof.

175. (Previously Presented) A method for stabilizing a radiopharmaceutical composition either comprising combining a radionuclide with a chelator, so as to form a radiolabelled complex, and combining the complex with a stabilizer; or comprising simultaneously reacting a radionuclide with a chelator and with a stabilizer;

wherein the stabilizer is selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising a dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

176. (Previously Presented) A method according to claim 175, wherein the stabilizer comprising a water-soluble compound containing selenium in the +2 oxidation state comprises selenomethionine, selenocysteine, or derivatives thereof.

177. (Previously Presented) A method according to claim 175, wherein the stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol further comprises selenomethionine, selenocysteine, methionine, cysteine or derivatives thereof.

178. (Previously Presented) A method according to claim 175 wherein the stabilizer comprising a dithiocarbamate compound comprises a compound of the formula:

wherein R1 and R2 are each independently H; C_1-C_8 alkyl; -OR3, wherein R3 is C_1-C_8 alkyl; or benzyl, either unsubstituted or optionally substituted with water solubilizing groups; or wherein R1, R2, and N combined together form 1-pyrrolidinyl-, piperidino-, morpholino-, 1-piperazinyl-; and

M is H^+, Na^+, K^+, NH_4^+, N-methylglucamine, or other pharmaceutically acceptable +1 ion, in the +1 oxidation state; or

M is Mg^{2+} or Ca^{2+}, or other physiologically acceptable +2 metal ion, in the +2 oxidation state.

179. (Previously Presented) A method according to claim 175, wherein the the dithiocarbamate compound is selected from the group consisting of 1-pyrrolidine dithiocarbamic acid ammonium salt, sodium diethyldithiocarbamate trihydrate, sodium dimethyldithiocarbamate hydrate, and combinations thereof.

180. (Previously Presented) A method according to claim 175 wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises cysteine or a derivative thereof, mercaptoethanol, dithiolthreitol, or pharmaceutically acceptable salts thereof.

181. (Previously Presented) A method according to claim 180 wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises a cysteine derivative selected from the group consisting of cystamine dihydrochloride, cysteine hydrochloride monohydrate, cysteine ethyl ester hydrochloride, cysteine diethyl ester

dihydrochloride, cysteine methyl ester hydrochloride, cysteine dimethyl ester dihydrochloride, cysteinesulfinic acid monohydrate, 5-thio-d-glucose, reduced l-glutathione, and combinations thereof.

182. (Previously Presented) A kit for the preparation of a stabilized radiopharmaceutical composition comprising:

(a) a first reagent which comprises a diagnostic or therapeutic radionuclide, optionally complexed to a chelator; and

(b) a second reagent which comprises a stabilizer selected from the group consisting of: a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state; a stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; a stabilizer comprising a dithiocarbamate compound; and a stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state.

183. (Previously Presented) A kit according to claim 182 wherein the water-soluble compound containing selenium in the +2 oxidation state comprises selenomethionine, selenocysteine, or derivatives thereof.

184. (Previously Presented) A kit according to claim 182 wherein the stabilizer composition comprising ascorbic acid or a pharmaceutically salt thereof, gentisic acid or a pharmaceutically salt thereof, human serum albumin, and benzyl alcohol; further comprises selenomethionine, selenocysteine, methionine, cysteine or derivatives thereof.

185. (Previously Presented) A kit according to claim 182 wherein the stabilizer comprising a dithiocarbamate compound comprises a compound of the formula:

wherein R1 and R2 are each independently H; C_1-C_8 alkyl; -OR3, wherein R3 is C_1-C_8 alkyl; or benzyl, either unsubstituted or optionally substituted with water solubilizing groups; or wherein R1, R2, and N combined together form 1-pyrrolidinyl-, piperidino-, morpholino-, 1-piperazinyl-; and

M is H^+, Na^+, K^+, NH_4^+, N-methylglucamine, or other pharmaceutically acceptable +1 ion, in the +1 oxidation state; or

M is Mg^{2+} or Ca^{2+}, or other physiologically acceptable +2 metal ion, in the +2 oxidation state.

186. (Previously Presented) A kit according to claim 182, wherein the the dithiocarbamate compound is selected from the group consisting of 1-pyrrolidine dithiocarbamic acid ammonium salt, sodium diethyldithiocarbamate trihydrate, sodium dimethyldithiocarbamate hydrate, and combinations thereof.

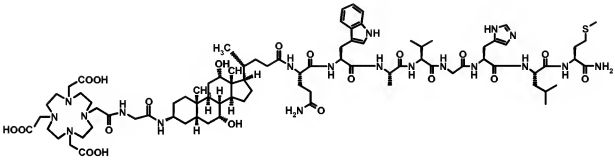
187. (Previously Presented) A kit according to claim 182 wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises cysteine or a derivative thereof, mercaptoethanol, dithiolthreitol, or pharmaceutically acceptable salts thereof.

188. (Previously Presented) A kit according to claim 187 wherein the stabilizer comprising a water soluble compound containing sulfur in the +2 oxidation state comprises a cysteine derivative selected from the group consisting of cystamine dihydrochloride, cysteine hydrochloride monohydrate, cysteine ethyl ester hydrochloride, cysteine diethyl ester

dihydrochloride, cysteine methyl ester hydrochloride, cysteine dimethyl ester dihydrochloride, cysteinesulfinic acid monohydrate, 5-thio-d-glucose, reduced l-glutathione, and combinations thereof.

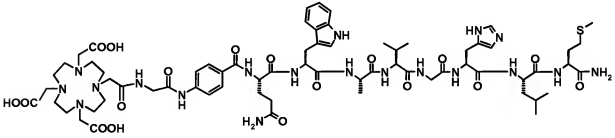
189. (Currently Amended) A stabilized radiopharmaceutical composition comprising a compound A or B of formula:

compound A



or

compound B

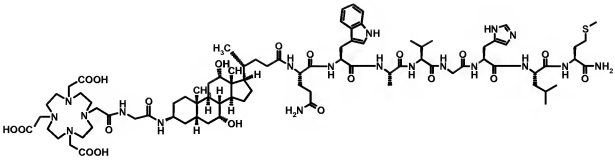


complexed with a radionuclide and a stabilizing composition comprising ascorbic acid, gentisic acid, human serum albumin, benzyl alcohol, and an amino acid selected from the group consisting of cysteine, methionine, or selenomethionine.

190. (Previously Presented) A kit for the preparation of a stabilized radiopharmaceutical composition comprising:

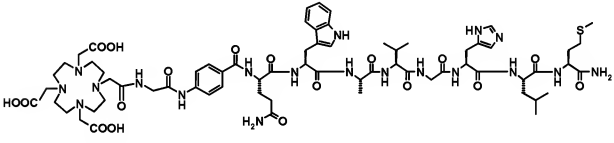
(a) a first reagent which comprises a compound of formula A or B,

compound A



or

compound B



and a water-soluble organic compound containing selenium in the +2 oxidation state; and

(b) a second reagent which comprises ascorbic acid or a pharmaceutically salt thereof, sodium chloride, EDTA, and benzyl alcohol.

191. (Previously Presented) A kit according to claim 190, wherein the first reagent further comprises a radionuclide and wherein the compound containing selenium in the +2 oxidation state is selenomethionine.

192. (Currently Amended) A kit according to claim 191, wherein the radionuclide is selected from the group consisting of ^{177}Lu, ^{111}In, ~~and~~ ^{90}Y, ^{67}Ga and ^{68}Ga.

193. (Previously Presented) A method of increasing recovery of radioactivity from a reaction that produces a radiopharmaceutical composition either comprising:

adding benzyl alcohol to a reaction mixture that produces the radiopharmaceutical composition; or

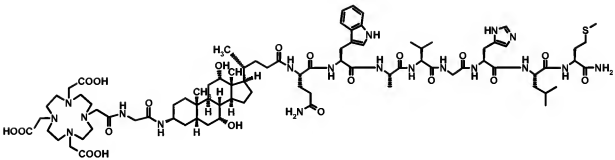
reacting a radionuclide with a chelator, to form a radiolabeled chelate, and reacting the radiolabeled chelate with a stabilizer solution comprising benzyl alcohol.

194. (Previously Presented) A method according to claim 193, wherein the stabilizer solution further comprises ascorbic acid or a pharmaceutically acceptable salt thereof or EDTA.

195. (Previously Presented) A method of reducing one or more oxidized methionine residues in a radiopharmaceutical composition comprising reacting the radiopharmaceutical composition with cysteine, dithiolthreitol or mercaptoethanol.

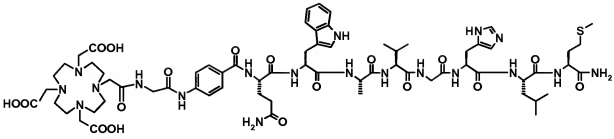
196. (Previously Presented) A method according to claim 195, wherein the radiopharmaceutical composition comprises a compound having the formula of compound A or of compound B

compound A



or

compound B

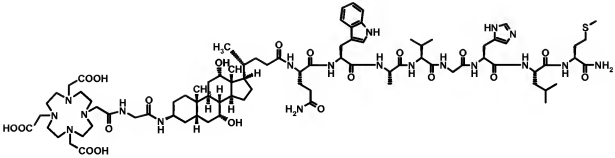


197. (Previously Presented) A method of reducing interference from metallic contaminants in a reaction mixture for the preparation of a radioparmaceutical comprising reacting the mixture with a dithiocarbamate.

198. (Previously Presented) A method of improving yield of a desired radiopharmaceutical, comprising adding a dithiocarbamate to the reaction mixture that produces the radiopharmaceutical.

199. (Previously Presented) A method according to any one of claims 197 or 198, wherein the dithiocarbamate is 1-pyrrolidine dithiocarbamic acid ammonium salt (PDTC).

200. (New) A stabilized radiopharmaceutical composition comprising a compound of the formula:

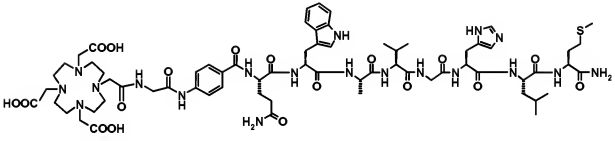


complexed with a radionuclide and a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state.

201. (New) A stabilized radiopharmaceutical composition of claim 200, wherein the water-soluble compound containing selenium in the +2 oxidation state is selenomethionine or a derivative thereof.

202. (New) A stabilized radiopharmaceutical composition of claim 200, wherein the water-soluble compound containing selenium in the +2 oxidation state is selenocysteine or a derivative thereof.

203. (New) A stabilized radiopharmaceutical composition comprising a compound of the formula:

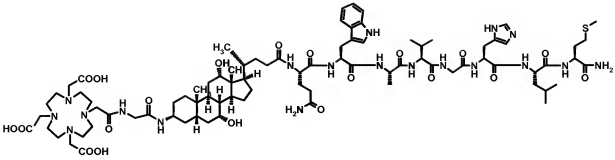


complexed with a radionuclide and a stabilizer comprising a water-soluble organic compound containing selenium in the +2 oxidation state.

204. (New) A stabilized radiopharmaceutical composition of claim 203, wherein the water-soluble compound containing selenium in the +2 oxidation state is selenomethionine or a derivative thereof.

205. (New) A stabilized radiopharmaceutical composition of claim 203, wherein the water-soluble compound containing selenium in the +2 oxidation state is selenocysteine or a derivative thereof.

206. (New) A kit for the preparation of a stabilized radiopharmaceutical composition comprising a compound of the formula:



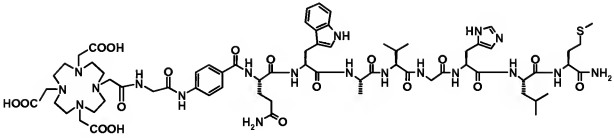
and a water-soluble organic compound containing selenium in the +2 oxidation state.

207. (New) A kit of claim 206, wherein the compound containing selenium in the +2 oxidation state is selenomethionine.

208. (New) A kit of claim 206, wherein the first reagent further comprises a radionuclide.

209. (New) A kit of claim 208, wherein the radionuclide is selected from the group consisting of ^{177}Lu, ^{111}In, ^{90}Y, ^{67}Ga and ^{68}Ga.

210. (New) A kit for the preparation of a stabilized radiopharmaceutical composition comprising: a compound of the formula:



;

and a water-soluble organic compound containing selenium in the +2 oxidation state.

211. (New) A kit of claim 210, wherein the compound containing selenium in the +2 oxidation state is selenomethionine.

212. (New) A kit of claim 210, wherein the first reagent further comprises a radionuclide.

213. (New) A kit of claim 212, wherein the radionuclide is selected from the group consisting of ^{177}Lu, ^{111}In, ^{90}Y, ^{67}Ga and ^{68}Ga.